A Study on Aspects of Working Life in Norway

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Preface

This thesis marks the end my master studies at the Department of Economics at the University of Oslo.

While carrying out the research for my thesis, I have been associated with the centre of Equality, Social Organization, and Performance (ESOP) at the Department of Economics at the University of Oslo. ESOP is supported by the Research Council of Norway.

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Any inaccurancies or errors in this thesis are mine, and mine alone.

Contents

1 Introduction

Employment practices in the Nordic countries have been described as unique in Europe. Special traits such as high work discretion, few work foremen and a widespread employee involvement in managerial desicions contribute to this particular structure. When we consider cooperation, we often focus on representation and influence on decicion making. Both local and more collective, centralized bargaining are key factors. Other interesting potential indicators of cooperation are the levels of worker turnover in the industry or firm which may be related to the level of cooperation and employment quality, and indicators such as educational levels, work-related training and possibilities for career development within the firm.

The focus of my thesis are the following questions: Do Nordic firms cooperate more than other firms in similar industries in Europe, and how does this affect profitability and employment quality in the Nordic countries? Related to this is the questtion: Does Norway perform better than other European countries on indicators of employment quality? Any direct effects of influence and cooperation on productivity, and in the Nordic countries in particular, are largely unexplored. Some studies have implied a positive correlation between productivity and representation, but the picture is generally mixed.

Increased competition in product markets, both nationally and internationally, has been suggested as a contributor to institutional changes. The increasing diversity in the global economy, decentralization of earlier collective bargaining structures, which has been observed in the majority of EU countries (Traxler, 2003), and diversion in workplace practices make these issues more than relevant than ever.

I will present a survey of the literature relating to participation and cooperation in the workplace, in addition to the literature connected to employment quality. I will also present some anecdotal evidence from interviews with managers and union members of the ERAMET factory in the city of Porsgrunn in Norway, where a large reorganization of work practices has been done based on the idea of worker involvement and self-directed teams. In addition to this, I will compare data from

the employment quality survey in the EU-countries with similar Norwegian data.

In the first section about information and coordination problems in labour market I will describe some of the most important coordination problems that arises between managers and workers, and introduce institutions as a way of reducing these problems. The Varieties of Capitalism approach will be used in order to explain national institutional differences and how these differences may result in differences in how the coordination problems are resolved.

In the second section I will compare the European and the Norwegian labour market. The Norwegian welfare model is presented, and the background for the widespread collective bargaining and representative participation which rose from the cooperation trials and legislation is described. The literature on effect of participation on productivity, performance and quality of working life is described.Furthermore, I compare Norwegian and European data on different measures on employment quality, and review some of the literature on the effect of employment quality and job performance. The sustainability of institutions are briefly discussed.

In the third section, I describe how ERAMET, a manganese production factory in Porsgrunn, Norway, has implemented a new work practice with self-directed teams and increased job autonomy, in order to increase production efficiency. I will compare production and turnover data of the production in ERAMET Norway and production and turnover data in an ERAMET factory in Dunkirk, France.

2 Information and Coordination Problems in Labour Markets

"Institutions are a set of rules, formal or informal, that actors generally follow, whether for normative, cognitive or material reasons, and organizations as durable entities with formally recognized members, whose rules also contribute to the institutions of the political economy(North, 1990)."
Institutions are sometimes used as a way of reducing coordination problems and information asymmetries in markets. In order to discuss Norwegian labour market institutions and institutions in general, I will present these problems, and link them to the Varieties of Capitalism approach of explaining institutional differences. In the following, I will first look at coordination problems, and problems linked to information asymmetries, such as moral hazard and adverse selection, and apply these to more spesific labour contexts.

One of the methods used for leviating some of the efficiency problems linked to coordination and information problems, are institutions, both formal and informal. Labour institutions, and their efficiency are therefore closely linked to efficiency in the labour market in general, but these institutions may vary between countries. The literature suggests that institutions that serve to reduce inefficiencies in some types of political economies may not produce efficient outcomes in countries that do not share the same characteristics in terms of history and culture, which is further discussed in the section on Varieties of Capitalism. I will start by presenting some of the most common coordination and information problems, and link them to labour market issues, and review some of the industrial relations literature that has tried to suggest institutional solutions to some of these problems.

Pareto coordination games

An important challenge in the area of working life is to get the different parties in the labour market, such as workers and managers, to coordinate on mutually beneficial outcomes. Coordination on vocational training, which is both beneficial for the employer because of the possible productivity gains and for workers which may gain more discretion at work and possible also monetary payoffs. Even though the benefits are evident for both parties, there is no guarantee that the

most beneficial equilibrium will be realized.

Zero sum games

A zero sum game is defined as a game where there always is one winner and one loser, and the advantage recieved by one player will be exactly equal to the disadvantage of the other. Zero-sum games have been used to describe different aspects of working life, most notably the distribution of power between workers and management. The Taylorism Thesis suggest this, implying that an increase in worker autonomy will reduce the possibilities of the management discretion.

2.1 Incentive problems

Incentive problems are caused by conflicts of interest between the different parties interacting with each other, and arises as a consequence of asymmetry of information, which makes it possible to engage in opportunistic behaviour . There can be conflicts of interest between workers and management related to the level of effort which should be executed, and in the sharing of production profit. There can also be conflicts of interests between the management and the stock holders, between managemenent and labour organizations, or labour organizations and workers, to mention a few. I will in the following focus on different types of conflict of interest between management and workers.

Moral Hazard in Working Life

Moral hazard as an economical concept was first introduced by Arrow (Arrow, 1963) in connection to economics of health care, where the incentive effect of insurance is discussed, and the changes in behaviour caused by the insurance. This can be related to working life by considering the situations where there are possibilities of "hidden actions", i.e. actions by the workers which are not observable by the management, but maybe only indirectly in the form of a noisy signal. Work effort can in many cases not be measured directly, but only indirectly in the form

of the level of production which also can be influenced by other variables other than effort.

I will in the following use a simple contracting framework(Martimort, 2002) where the principal (here, the management) offers the agent a contract t, which is the wage the agent recieves. The agent (here, the worker) can exert costly effort e which influences the level of realized production, q. We normalize the effort levels such that e is given as either 0 or 1. The disutilty of effort, $\varphi(e)$ is defined as

$$\varphi(0) = \varphi_0 = 0 \tag{1}$$

$$\varphi(1) = \varphi_1 = \varphi \tag{2}$$

The agent gets the transfer t from the principal. The utility associated with the transfer $u(t)$ is increasing and concave, and $u(0) = 0$ which implies that the agents have risk averse preferences. Assuming a separable utility function, we can present the agents utility in this manner:

$$U = u(t) - \varphi(e) \tag{3}$$

The level of production is a stochastic variable, which can take two different levels $\overline{q}$ (high production) and $\underline{q}$ (low production). This variable is dependent on the level of effort, but the production level is not a perfect signal. The probabilities of a high production level on different levels of effort are given as:

$$Pr(q = \overline{q}|e = 0) = \pi_0 \tag{4}$$

$$Pr(q = \overline{q}|e = 1) = \pi_1 \tag{5}$$

where $\pi_0 < \pi_1$
. Since the wages need to be based on measureable levels, the wages, t, are made

dependent on the stochastic production levels, q. The manager's value of the production is given as $S(q)$ where $S'(q) > 0$, $S''(q) < 0$ and $S(0) = 0$ This yields, for high levels of production $\bar{t} = t(\bar{q})$ and for low levels of production $\underline{t} = t(\underline{q})$. The principal's expected utility is as follows,

$$V_0 = \pi_0(S(\bar{q}) - \bar{t}) + (1 - \pi_0)(S(\underline{q}) - \underline{t}) \tag{6}$$

with no effort (e=0)

$$V_1 = \pi_1(S(\bar{q}) - \bar{t}) + (1 - \pi_1)(S(\underline{q}) - \underline{t}) \tag{7}$$

with effort (e=1)
In order for the contract to be executed, two constraints have to be satisfied. The first constraint is the individual rationality constraint, which ensures that accepting the contract is associated with higher expected payoff than declining it. Second is the incentive compatibility constraint, which ensures that using high effort must yield a higher payoff than low effort. Another way of stating incentive compatibility is that there are no conflicts of interest between managers and workers.

Incentive constraint:

$$\pi_1 u(\bar{t}) + (1 + \pi_1)u(\underline{t}) \geq \pi_0 u(\bar{t}) + (1 - \pi_0)u(\underline{t}) \tag{8}$$

Individual rationality constraint:

$$\pi_1 u(\bar{t}) + (1 - \pi_1)u(\bar{t}) - \varphi \geq 0 \tag{9}$$

If we assumed risk neutrality, transfering the risk from the manager to the worker would be without any extra cost, since the workers produce the first-best contract levels. But since we usually assume that the workers are risk averse, inducing effort by shifting the risk over to the workers will be costly. This is a result of wages being dependent on a stochastic production level, where the worker can only

partially influence the probability of reaching the high production level. There is a level of uncertainty linked to the wages the worker recieves, and risk aversion implies that the agent would be willing to pay a risk premium to avoid this insecurity. In general, insecurity in relation to wages is connected to a lower level of job satisfaction.

One of the ways of dealing with the incentive problems linked to moral hazard and effort levels is to introduce risk-sharing devices such as efficiency wages, stock options, etc. The solutions to the incentive problems may also be dependent on how the workers are perceived by the management. If workers are assumed to be lazy or irresponsible, methods of direct control may be used, but in the case where workers are assumed to be responsible and motivated, other solutions of this problem may be more efficient. More on this in section 4. An example of this is the finding that countries with low levels of trust are more likely to use methods of direct control and hierarchy in working life than countries with high levels of trust (Arundel et. al, 2007).

Adverse selection

Adverse selection arises when there are hidden characteristics in contracting, or asymmetry of information before contracting is done. The problem was introduced by Akerlof(Akerlof, 1970) where the information asymmetry between the buyers and sellers of used cars leads to there only being cars in the worst condition ("lemons") left in the market. The reason for this was that the sellers of the good cars did not recieve enough money compared to the value of the car, because of the existence of lemons, which contributed to a reduction of willingness to pay among consumers without information about the quality of the cars. He showed how the mere presence of poor quality in a market with information asymmetries could result in quality deterioration in the entire market, because the high quality cars were removed from the market.

In order to link this to working life, I will look at a case of high- or low-skilled workers, where the level of skill is unobservable for the manager(Martimort, 2002). The workers are thought by nature to either be inefficient and producing with a

high cost $\overline{\theta}$, with probability $(1-v)$ or efficient, producing with a low cost, $\underline{\theta}$, with probability v . The respective production cost functions are given by:

$$C(q, \underline{\theta}) = \underline{\theta} q + F \tag{10}$$

with probability v, and

$$C(q, \overline{\theta}) = \overline{\theta} q + F \tag{11}$$

with probability $(1 - v)$

The spread of uncertainty is given by

$$\Delta\theta = \overline{\theta} - \underline{\theta} \tag{12}$$

Complete information

If complete information were possible, the first-best output would be decided by the marginal value of the firm of production and the marginal cost of the worker,

$$S'(\underline{q*}) = \underline{\theta} \tag{13}$$

$$S'(\overline{q*}) = \overline{\theta} \tag{14}$$

and the production level would be higher for the most efficient type. Since the principal in the full information case can observe the agents type, the different types are offered different contracts, which satisfy their participation constraints:

$$\overline{t} - \overline{\theta}\overline{q} \geq 0 \tag{15}$$

$$\underline{t} - \underline{\theta}\underline{q} \geq 0 \tag{16}$$

Because of complete information, the firm will extract the entire profit, and the workers will get transfers/wages equal to their marginal cost of effort.

Incomplete information

In the case of incomplete information, the manager cannot separate between the

efficient and inefficient workers, and the contract now has to satisfy incentive compatibility constraints, for the contracts to be feasible.

$$\bar{t} - \overline{\theta}\overline{q} \geq \underline{t} - \overline{\theta}\underline{q} \tag{17}$$

$$\underline{t} - \underline{\theta}\underline{q} \geq \bar{t} - \underline{\theta}\overline{q} \tag{18}$$

This can be interpreted as follows: The low-skill worker cannot be better off by choosing the high-skill contract (Equation 17) and for the high skilled workers by choosing the low-skill contract (Equation 18).
An example of adverse selection in labour relations can be differences in skill levels among workers. A highly skilled worker will most likely be more productive and efficient than a low skilled worker, but it is not always possible to separate between them. One solution to this problem is a shutdown of the least efficient production type, such that it only satisfies the individual rationality constraints of the efficient workers. If this is not possible or wanted, some rent has to be paid to the efficient type in order to ensure incentive compatibility.

Market signals, where the agent can reveal his true type by behaviour correlated with the abilities which arec harder to measure, is a way to separate between different types of agents (Spence, 1973). These signals may be degrees from prestigous universities which send a signal of ability of hard work and high effort. Another potential signal is the number of hours spent at work.If the manager cannot observe the quality of work, a high number of working hours could signal that you are a high quality worker.This practise is well-known in law firms, where promotions often are based on "billed hours" and because of this, lower-level associates work inefficiently long hours (Landers et al., 1996).

The Hold-up Problem

"The implied demands on the rationality limits of human actors are shown to be severe and the associated costs of adapting to changing job and market circumstances are shown to be considerable for jobs in the idiosyncratic kind. Collectivizing the employment agreement alleviates these conditions in that it serves to economize on transaction costs in both bounded rationality and attenuate oppor-

tunism" (Williamsson, Wachter, Harris 1975) The Hold-up problem arises when there are mutual gains from cooperation between the parties negotiations, but both parties have to make relation-spesific investments. These investments are investments that are directly linked to some spesific relation (i.e. training of workers to do spesific tasks more efficiently, investment in a special type of production equipment etc.) and they have little value if the investments are used in other relations. This form of commitment may increase one of the parties bargaining power. Hold-up problems leads to inefficiencies, because both workers and employers are reluctant to do relation-spesific investments, even though they would be mutually beneficial. Working life institutions may reduce the inefficiencies from both information asymmetries and hold-up problems. They are discussed in the following section.

2.2 Varieties of Capitalism - An Institutional Approach to National Differences

Why do the levels of innovation and the type of innovation differ among countries? Why do we see a clustering of some forms of industries and technology in some countries, but not in others? When introducing the literature of industrial relations, the theory of Varieties of Capitalism (VoC) is essential. The VoC theory is used to explain institutional differences between countries. In its most simplistic form, VoC uses two different types of market economies, and explains differences in innovation and diversity betweeen countries with institutional differences. It looks at where coordination problems get resolved, and also the differences in solutions to the coordination problems in relation to the institutional structure in the country(Hancke, 2009).

Liberal and Coordinated Market Economies

The two different categories for the market economies are named Liberal Market Economies (LMEs) and Coordinated Market Economies (CMEs). LMEs are used as a common term for the economic market structure which we observe in countries such as the UK, the US, Austria, Canada and Australia. The economy is char-

acterized by fluid markets for production inputs such as labour and capital, and fierce competition in the product markets. The companies focus on stockholder value, and avoiding hostile takeovers.

CMEs are used for the rest the countries in Europe along with Japan. The economy is characterized by a greater deal of collective bargaining, regulations and less fluid labour and capital markets. There are more widespread cross-shareholdings and long term involvement with investors and banks. This again allows companies to focus on other aspects than short-term profit without fearing hostile takeovers or losing their investors.

In "An Introduction to Varieties of Capitalism." Hall and Soskice implied that there would probably be some main differences between both types of market structure both on the labour market, and in what kinds of innovation one would see in the different economies (Hancke, 2009). The main difference in innovation seemed to be a higher amount of radical innovation in the LMEs, and incremental innovation in CMEs. Radical innovations are often found in areas such as the farmaceutical industry and in the IT sector, and incremental innovation more in "traditional" manufacturing industries. This would again create some "comparative institutional advantages" which would lead to different types of production and innovation in different countries. To look closer at what these advantages may be, I will start by naming the five different areas where the coordinations problems are resolved (Hancke, 2009).

Main Areas of Coordination

In the original VoC theory, the main focus was on four different areas of the political economy, namely vocational training and education, corporate governance, inter-firm relations and employees, as areas of institutional coordination. These are further discussed in the following sections.

Vocational training

Vocational training and education at the workplace involves investment in spesific skills, and ensuring that these investments are profitable both for the worker and manager. To explain the differences between the level of specific investment in training between the CMEs and LMEs, the level of employment security is crucial. Because of the "hire and fire" policies which are characteristic for many companies in LMEs as an effect of fluid labour markets, and the usual career path which often includes many different companies and tasks, the employees are reluctant to gain very industry or company-spesific skills, and are more inclined to choose to learn more general skills which can be utilized in a variety of jobs(Hancke, 2009). Since the labour market is fluid, the companies who use resources on personell training, can risk that other companies steal their employees. Because of this free-rider problem, the industry is therefore greatly dependent on institutions such as vocational schools and universities to give them skilled labour.

In the CMEs, on the other hand, there is a larger extent of employment security. The companies are not as free to fire and hire and reduce employment (i.e. involuntary part-time work) so the employees are not reluctant to gaining company-spesific skills. A generous unemployment insurance and benefit scheme also makes sure that you have the possibility of looking for relevant work over a longer time period after losing your job or entering the job market. Since there is less poaching of skilled employees between sectors, the companies are also more positive towards providing vocational training and education, i.e. internships. The risk of some other company stealing your intern when the training is over, is much smaller.

The extreme variety of avoiding the incentive problems which follows vocational training, is the Japanese lifetime employment model, where employees are given contracts providing lifetime employment. When given this opportunity, the employees have no problem with gaining very spesific skills and do not feel threatened by new technology, since it does not threaten own employment (Gardner, 1998). There are of course some incentive and efficiency problems related to lifetime employment, but these are beyond the scope of this thesis.

Inter-firm relations

Inter-firm relations are a way of leviating hold-up problems between suppliers and clients. They are also a way for firms to share information and experiences between themselves, and cooperate on areas such as workforce training, how to reduce sickness leaves and so on. One example of an inter-firm relation is the Grenland Industry Cluster (ICG) which is a joint effort of the management and unions in different process industries in Grenland, a district of Norway.[1] They cooperate in the areas of vocational training, security measures, health services for the employees and maintenance and supply of gas to the industrial park at Herøya.

Institutions in CMEs and LMEs

In LMEs, institutions are complementary to market as a way of solving coordination problems. This includes institutions which provide exchange of information between firms and investors, for example credit rating companies and third-party analysists, where the same parties also offers monitoring of behavior in order to reduce moral hazard, and sanctioning of deviant behavior, mainly through the justice system. Coordinated Market Economies relies on a larger variety of institutions in order to solve the same problems. All parties rely on coordination through strategic interaction. Therefore, institutions are created to make the different parties coordinate as efficiently as possible, and there are more institutions of the deliberative type. These institutions rely on the possibility of credible commitment, and information being shared to reduced the uncertainty regarding the strategies of the different actors.

Deliberative institutions

Deliberative institutions are institutions which makes it possible for different actors to cooperate with each other. The Norwegian example of one of these deliberative

[1]The involved parties are Ineos Polyolefins, Eramet, Herøya Industripark, Ineos Chlor Vinyls, Norcem, Ineos Olefins (Noretyl), Norske Skog Klosterøya and Yara.

institutions is the three-party cooperation between the government, the Confederation of Norwegian Enterprise (NHO) and the Norwegian Confederation of Trade Unions (LO).

Institutional Coherence and Macroeconomic Performance

Macroeconomic performance indicators such as inflation, unemployment and economic growth have been linked to the degree of institutional coherence in the economy. This idea was based on institutional complementaries, which implied that the presence of one institution might increase the efficiency of another(Hancke, 2009). It does not suggest that either LMEs or CMEs are superior in order to achieve high macroeconomic performance, but that it is linked to the degree of institutional coherence (countries with institutions based on a high degree of non-market coordination will be better off if the other institutions also share the same non-market characteristics, and vice verca).

Limitations and Main Critisisms

The Varieties of Capitalism model has been critized for depending very heavily on the US in order to empirically confirm the ideas of innovation differences between Liberal Market Economies and Coordinated Market Economies. Many of the worlds most innovative countries have close ties to the US, which may suggest that international relations may play a role, and not only domestic institutions. The role of the state in sponsoring R&D is also downplayed in the VoC literature, where the main arena of innovation is within the firms. Looking at universities or research regarding national defense, state-provided research plays an important role(Taylor, 2004).

When comparing institutional coherence and macroeconomic performance(Kenworthy, 2006), the empirical evidence did not give much support, if any to the coherence hypothesis from the original VoC article. There were no significant relationships between coherence and performance, and several "non-coherent" countries performed just as well as the most coherent ones. This is the case for Denmark, which has labour market institutions similar to those in LMEs (i.e. the "flexicu-

rity" system). I will use this framework to explain the characteristics of Norwegian working life, but also specifically the case of the ERAMET factory. My main objective is to adress the differences between working life in Norway and other countries, and also to see if the Norwegian model might contribute to increased productivity. According to the Varieties of Capitalism hypothesis, it is not unlikely that Norway will have a working life which has significantly different institutional design than other European countries. In the following section I will look at the characteristics of working life in Norway, and differences between Norway and the Nordic countries in areas such as employment quality and unemployment.

3 The European Labour Market - Is Norway Different?

The European Labour Market is characterized by large institutional differences between countries(Davoine et al., 2008). While some countries are characterized by relatively fluid and unregulated markets for labour and capital, others have higher levels of employment protection(OECD, 2004) and are more characterized by collective bargaining and state intervention. The degree of collective bargaining and union density varies greatly between countries, from 85% of the workforce being members of unions in Iceland to 10% in Lithauania[2]. The degree of employment quality and worker participation also varies greatly, which is discussed in the following.

The highly flexible labour market and low welfare costs have been mentioned as one of the reasons for the good macroeconomic performance of the US in the 90s, where the rising unemployment and stagnation of the continental European countries in a similar way were attributed to rigid and regulated labour markets. Although some administrative procedures and regulation of temporary contracts have a negative effect on performance, the most important reason for the superior economic performance was mainly due to more advanced technology and higher skill levels within the different industries. However, the different tax levels and general labour market policies could not account for the differences between the US and the rest of Europe (Aiginger, 2005). Unemployment in Europe rose after

[2]See Appendix

the financial crisis, but the impact was very different from country to country. While unemployment in Spain rose from 11,8% in the third quarter of 2008 to 20% in the second quarter of 2010, it went from 2,5% to 2,6% in Norway. The main differences I will look at will be the differences in degree of participation and cooperation between Norwegian working life and other European countries, and differences relating to employment quality. I will then review some of the literature on how these two measures may influence productivity and economic performance.

3.1 The Norwegian Welfare State and Labour Market

Characteristics of the Norwegian Welfare State

I will in the following differ slightly from the original LME/CME and discuss some of the main varieties of welfare states. One of the main critisisms of the VoC theory is that it does not take into account some of the main differences between countries in Europe, and also the differences between i.e. CMEs in continental Europe and Japan (Hancke, 2009). This thesis focuses on the Norwegian/Nordic welfare state, and even though the coordinated market economies share several similarities, I will point out some of the main characteristics of the Nordic welfare model, in comparison to similar systems in Continental Europe. The welfare state consist of government provision of some goods, like education and in some countries health care, and also redistribution of income between different individuals.

The liberal welfare model and the countries which the model applies to this is very similar to the earlier characterization of LMEs. It applies to countries such as the US, Australia, New Zealand and Switzerland, and also to an increasingly larger degree the UK. These systems are characterized by lower tax levels, and a more contingent and less generous benefit systems. Benefits related to unemployment and retirement, and to a varying degree medical benefits are linked to employer and employee contributions. In the CMEs, however, there are some differences between countries in Europe associated with the conservative welfare model[3] and the Social Democratic countries[4] .Generally, in the countries with a conservative

[3]Austria, Belgium, France, Germany and Italy
[4]Norway, Denmark, Sweden, the Netherlands, Finland

welfare model, there are both higher tax and benefit levels than in the liberal model, but less generous than the Social Democratic countries. The replacement rates[5] of unemployment are higher in the Social Democratic countries than in continental Europe. Sickness benefit replacement rates are generally higher in the Social Democratic countries than in the conservative countries, however, this varies within the Nordic countries (100% coverage in Norway, and 59% coverage in Denmark). The proportion of the labour force that is covered by collective bargaining is also higher in Norway than the other Social Democratic countries and the conservative countries, and Norway has the second highest welfare state generosity score, only surpassed by Sweden (Clausen Jochen, 2007).

The Norwegian welfare model has a number of benefits which are not contingent on earlier income, such as child benefits and health benefits. Other benefits such as maternity leave, unemployment benefits and retirement benefits are contingent on earlier contributions. In the following I will mainly focus on the work related aspects of the welfare state, especially collective bargaining and the social security system. I will also give a brief introduction to the Norwegian cooperation trials, which influenced the legislation around working life to a large degree(Finsrud, 2009).

The National Insurance Act

The Norwegian state provides insurance against different kinds of income shocks through the National Insurance Act.

"§ 1-1. Formål Folketrygdens formål er å gi økonomisk trygghet ved å sikre inntekt og kompensere for særlige utgifter ved arbeidsløshet, svangerskap og fødsel, aleneomsorg for barn, sykdom og skade, uførhet, alderdom og dødsfall.
Folketrygden skal bidra til utjevning av inntekt og levekår over den enkeltes livsløp og mellom grupper av personer.
Folketrygden skal bidra til hjelp til selvhjelp med sikte på at den enkelte skal kunne forsørge seg selv og klare seg selv best mulig til daglig. "

[5]The relative size of benefit after taxes to income when working after taxes

The National Insurance act defines the purpose of the National Insurance. The goal is reducing income insecurity and also to do some redistribution of income, and the idea of helping people help themselves is important.

Collective Agreements and Wage Bargaining

The collective agreement between the Norwegian Confederation of Trade Unions (LO) and Confederation of Norwegian Enterprise (NAF/NHO) was first signed in 1935. Motivated by the reccesion, the destructive conflict level in some industries and the joint wish of continued competitiveness, the agreement was formed. The interests of export industry were therefore very imporant in the collective wage bargaining, which meant that international trade became an important factor in labour market institutions, and also in wage development. The conflict level in the labour market was also greatly reduced, and from being one of the most conflict-ridden labour markets in Europe, Norway reduced the conflict level to almost non-existence. Earlier literature suggested that the differences in union density decided which impact unionized labour had on the labour market. The research was mostly focused on the inefficiency effects of unionized labour. Calmfors and Driffil introdused their model arguing that the inefficiency loss connected to unionized labour was smaller when there were either a very low or very high degree of union centralization(Calmfors et al., 1988). Later, studies have suggested that the impact on economic performance mainly stems from the union coverage and not the union density, which found no or little support for the hump-shaped theory (Aidt, 2002) (Aidt, 2008).

The collective agreement created the ground rules for bargaining and cooperation between the employer and the employee. In addition, it also include the workers influence on managerial decisions. The agreement is revised continously, usually every fourth year, and after the first agreement in 1935, supplementary agreements concerning work environment, gender equality, technological development, working hours and part time work were added. Later on, there have been several "collective agreements" between employer and employee organizations. Some of the major influences on employment legislation in Norway are the Norwegian cooperation trials. It is therefore worth mentioning the motivation behind these trials, and the

effects they had on Norwegian working life.

The Norwegian Cooperation Trials - LO/NAF

The Norwegian Cooperation Trials were conducted in 1962. The main motivation for the changes in the way employment was organized was the idea of democracy, and the labour market as an arena for democratic development (Herbst 1971, 1976). Increasing democracy in the workplace would then spread to other areas of the society, including educational institutions, family and community, administration and research (Gustavsen et al., 2010).

This was the first time Confederation of Norwegian Enterprise (NAF, later renamed NHO) and LO cooperated on a research and development project related to this area. The different companies were chosen on the background of being leaders in their respective field – and in Norwegian industry in general. The main idea was to try to introduce self-directed teams and increase the degree of workplace democracy. After the trials, the knowledge aquired should be spread democracy out to other firms in order to increase efficiency, innovation and democracy. This effect would then disperse into society in general. However, despite the great success of many of the cooperation trials, the dispersion effect did not seem to occur, even though the results of cooperation trials were well known among researchers, taught at universities and presented at seminars. Even within the firm where the trials were done, the ideas did not disperse. Some accredited the success of the trials to the general success of the firm itself(Finsrud, 2009). Some firms even shut down the part of the production connected to the trials because the differences in work practices introduced by the trials seemed "incompatible" with the rest of the firm(Finsrud, 2009) (see section on Christiania Spigerværk). The dispersion of knowledge from the cooperation trials also happened through legislation, and the results from the trials were very much involved in designing The Agreement on Working conditions by including psychosocial factors and the right to participate, in the legislation. I will briefly mention two of the factories which participated in the cooperation trials.

Christiania Spigerværk - The Thread Factory

The interest among the general industry to participate in the experiment was small. The democratic ideas which the project was based on, were in conflict with the main Taylorist ideas which were prevalent in the industry. Chistiania Spikerværk agreed to participate in the project, but only if the thread factory could be the area to conduct the experiment, since it was already ridden with problems, and the possibility of a worse performance was low (Gustavsen et al., 2010).
After the project started, cooperation contributed to a higher level of production than earlier. The higher level of productivity also lead to an increase in the performance-based wages for the workers at the thread factory, and the inequality in wages and status which followed were a source of conflict. Therefore, the local union was highly resistant to the project, and suggestions for technological improvement from the workers were largely ignored by the engineers. After three months, the project ended and the thread factory went back to its original production process. Several of the employees left their jobs due to disappointment.

Hunsos Factories

The next factory which participated in the project,was Hunsos Factories. They worked in wood processing, and were about to implement a new cellulose process in their production. This process was concidered to be complicated, and the management wanted to cooperate with the workers to find the best possible production method. With the experience with Christiania Spigerværk in mind, the top management was largely involved in the project design, in order to avoid the problems that occured when workers were ignored by the engineering staff, the union was resistant to the more performance based salary scheme because of the wage inequalities it created[6].

The main idea was to use team based work, where the shift managers were responsible for large parts of the operation. This practice also lead to more multitasking, and also transfering of skills between different vocational groups. After a year, the Hunsos Factories continued on the technological and organizational de-

[6]This issue is also discussed in the section about ERAMET

velopent themselves, and the production continued with success for several years (Gustavsen et al., 2010).

The Basic Agreement Part B – Cooperation Agreement

"The object of this agreement is to strengthen and further develop cooperation between the employees, their representatives and the management in the individual enterprises and groups of companies"[7]

Work councils
Work councils shall be established in enterprises with more than 100 employees, and in addition be established in enterprises with less than 100 employees if it is requested from one of the parties and the central organizations agree.

"The main task of the works council is, through cooperation, to work for the most efficient production possible and for the maximum wellbeing of all who work at the enterprise."[8]

In short, the work council shall be informed by the management on financial status of the enterprise, and sales and production conditions. In addition, the works council gets access to the same financial information as the shareholders receive. Substantial changes in modes of production, investments, plans for expansion, reductions or restructuring shall be submitted to the council before making any decicions. The council shall establish guidelines for vocational training if necessary, guidelines for new employeesm, and authority to implement safety measures.

The Agreement on Working Conditions

As an expansion to the main collective agreement signed in 1935, an expansion named "Arbeidsmiljøloven" Agreement on Working Conditions), covers most of the workers in Norway, with a few exeptions[9]. The agreement sets a baseline on what kind of working conditions are legal, and a deviation away from the agreement in the disfavour of the workers is not possible. This agreement included

[7]From the Basic Agreement
[8]From the Basic Agreement
[9]See Arbeidsmiljøloven

psychosocial factors and the participation and involvment of workers in working conditions related areas.

Working Environment Councils
The worker influence in Norway is large, and supported by legislation based on cooperation and collective bargaining. However, the question still stands: Does Norwegian workers have more autonomy and influence on managerial decisions than other countries in Europe? And does this participation matter?

3.2 Working Life in Norway and The Collective Agreement

Discretionary learning at workplaces is correlated with high levels of innovation, and also with the level of training provided to employees (Arundel et. al, 2007). The Norwegian collective agreement specifies that the employer needs to provide some form of work-related training if it is considered neccesary, which could contribute further to an increase in both the number of firms with workers discretion, and also to the amount of innovation in the workplace. Because of the risk associated with achieving spesific skills, some degree of income and work security is needed. The Norwegian Insurance Act contributes to this, by securing unemployment benefits, and the collective agreement by ensuring some work security.

Norwegian respondents reported high levels of work satisfaction, only surpassed by Denmark, and Norway is also the European country with the lowest percentage of workers working more than 48 hours a week.[10] There is a clear tendency that employers with either learning or LEAN mode of production invests more in education and training of their employees, where the effect is greatest in the learning model. Fixed-term contracts are more often used in firms using the LEAN model, while Taylorist production is more associated with temporary employment practises. Employment contracts of unlimited durations are also more common in firms with a learning production.

The degree of regulation in the labour market has been mentioned as one of the reasons for the differences in types of production methods between countries. There

[10]Fourth European Working Conditions Survey

is some support for this, in the form of a positive correlation between the strength of the national vocational training and degree of learning forms of production in a country. Employment protection may increase the degree of advanced work organization, since it increases the ability of adopting new practises.

3.3 Production Models - A Brief Introduction

When looking at different types of production models, some characteristics are often mentioned, such as autonomy, degree of hierarchy, complexity of tasks and coordination. Job autonomy is often measured by the degree of having a choice of working partners, being able to take a break, choosing or changing the speed of work, methods of work and order of tasks.[11].

Simple Model

This type of production is characterized by informal and non-codified work, often used in service industries such as retail, hotels and restaurants and other forms of personal service.

Learning Model / Discretionary Model

The learning model is characterized by a high level of work autonomy and task complexity, and a widespread use of semi-autonomous work groups(Kalleberg et al., 2009). As the name suggests, this model of production also has a high degree of learning and problem-solving. The learning form of production is especially developed in the more advanced service sector of the economy (banks, business services and so on). The learning model is most common in countries with regulated labour markets, with a high level of employer coordination around areas such as pay and vocational training, and are most common in the Nordic countries and the Netherlands (Edward and Antoine, 2005).

[11]Fourth European Working Conditions Survey

LEAN/Japanese Model

The LEAN model is characterised by team-work and problem solving groups, rigid quality standards and production norms, and has a more hierarchical structure than the learning model. The degree of autonomy in work is smaller than in the learning model, and the tasks are often standardized. The LEAN model is often found in different areas of manufacturing, and is most common in the UK, Ireland and Spain (Edward and Antoine, 2005).

Taylorist Production

The Taylorist Production can be looked at as a variety of the assembly line production, where the workers have very limited and often repetitive tasks, with a high degree of specialization. Taylor was a firm believer in division of labour as a way to improve efficiency, and replacing rule-of-thumb behavior with a scientifical approach to every operation done in the production. Because of the limited qualifications needed to perform relatively simple tasks, the business does not need to invest significantly in training of the workers. This makes the workes easily replaceable, either by less expensive labour, i.e. immigrants or outsourcing production to low cost countries entirely, or by replacing workers with machines. Low or non-existent worker's discretion also reduces the amount of in-house innovation (Arundel et. al., 2007). Teams and job rotation are prevalent, which may suggest that these types of work may be included as a mere tool for cost reductions, often called "flexible Taylorism" (Edward and Antoine, 2005).Taylorist modes of production are most common in southern European countries.

When considering the different work organizations, both teamwork and job rotation were higher in Taylorist and LEAN companies than companies that focused more on discretion and learning. This might imply that the mere presence of teamwork, job rotation etc. is not necessarily a good signal for innovation and learning, but might actually be seen as a way to overcome some of the Taylorist limitations in respect to monotony and to get the workers more involved, but without including worker's discretion to the same degree as in LEAN or learning models.

3.4 The Effect of Participation on Productivity, Performance and Quality of Working Life

The effect of an increase in productivity is not necessarily beneficial for the workers. There is a conflict of interest between management and workers in how the profits gained from the productivity increase should be shared. The management may want to increase productivity without increasing payouts whatsoever (Grimsrud and Kvinge, 2006).

We can separate between different types of participation, in order to examine the different effects. Management-led involvment implies that workers may express their opinion and share information and experiences with the management. However, this does not include any control rights or rights to return.
Profit-sharing schemes and employee ownership is another part of participation. This type of involvement puts an extra risk on the workers (in the employee ownership case) because both income related to work and savings now are dependent on the success of the same enterprise.

Representative participation is the last type of participation, which includes some sort of control rights to workers. Examples of this is Work counsils, working comittees, unions and workers' representatives on board of directors (Grimsrud and Kvinge, 2006).

How does participation improve productivity? Participation may improve communication and lower transaction costs of information sharing, it may improve conflict resolutions and increase the willingness to accept new technology (Brown et al., 1999).

As mentioned earlier, a profit-sharing scheme may reduce the moral hazard problem by reducing the conflict of interests between workers and management. If workers are more in control of their own working situation, this may also reduce this conflict (Grimsrud and Kvinge, 2006).The increased control rights may also contribute to negotiation of less productive work practices, which may decrease productivity (Frick, 2002).

The net effect of participation on productivity seems to be influenced by the institutional settings in the economy. If one or more of the types of participation are present, this seems to increase the productivity gains of the other types (Grimsrud and Kvinge, 2006).

Based on the 2003 Norwegian survey of working conditions, some of the effects of participation on employment quality were examined, such as levels of skill development, workload, support, ambiguity and stress. The authors used three dimensions of participation. These were autonomy in work tasks, consultation on organizational decisions and team work. They got their data from the Survey of Living Conditions in 2003, and used this to measure the relevant variables of work satisfaction and employment quality.

There are several positive effects of participation on working life, but the picture is mixed. Consultation on organizational desicions reduced the work load for both men and women. It also reduced ambiguity, which increases job satisfaction. Autonomy reduces stress, both for men and women, and was also positively related to skill development and a higher work load for men (possibly because of the increased responsibility). When looking at team work, they found a positive effect between team-work and stress. The effect of the increased work-related stress in teams was especially notable in unsupervised teams. Self-directed work groups increased work loads and ambiguity for women (Kalleberg et al., 2009).

One reason for the mixed effect of participation may be the incentives for firms to engage in these types of work practices. If team work or other new practices are introduced in order to enhance quality, innovation and learning, the effects will not be the same as for the firms introducing team work as a form of intensifying production (Kalleberg et al., 2009).
The macroeconomic performance effects of participation are not the main focus of this thesis, but I will mention some of them briefly. The effect of coordinated bargaining seems most important when there is change in the economy, where this can increase the efficiency of responses to different types of economic shocks. Centralization of collective bargaining internalizes externalities of higher wages such

as unemployment and inflation, and improves economic outcomes (Aidt, 2008).

3.5 Comparing Norwegian and European Employment Quality Indicators

Some literature suggests a correlation between employment quality and productivity and performance (Judge et al., 2001). Low levels of work satisfaction are linked to long or non-standard working hours, high levels of work intensiy, low levels of job control and exposure to physical and psychosocial risks.[12] Earlier literature has found a "Scandinavian effect" when looking at the employment quality levels between the EU-15 countries. This effect was apparent both in the area of participation, workplace training and the share of untrained workforce, which was the smallest in Europe, and this regional effect was significant even after introducing several control variables (Gallie, 2003). [13] This suggests that there may exist some regional similarities and effects in relation to employment quality. In order to compare the quality of working life in Norway with the rest of Europe, I will use the LAEKEN indicator study, a study of employment quality in the EU countries. This study was based on a survey in the different countries, looking at indicators such as quality of employment, financial security, education and training, gender equality, job security, level of unionization, productivity and influence.

3.6 Background - Monitoring Employment Quality in Europe

The LAEKEN indicator study (Davoine et al., 2008) was a study of employment quality in the EU countries. Wages were not taken much into consideration in this survey, because it was shown that as long as you had a minimum of financial and job security and not lower wages than colleagues and peers, the actual wage level was not that important. Some wage indicators were included, especially to capture any "working poor". Possibilities for career advancement, were considered to be much more relevant.

[12] Fourth European Working Conditions Survey

[13] With one exeption: When introducing controls, the regional effect of employment quality was only apparent for the women from Finland, and not the men

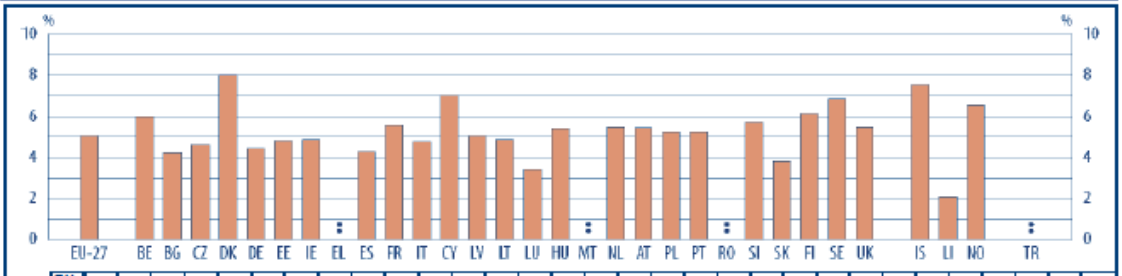
After measuring the levels of the different indicators, Davoine et al. sorted the different EU countries into different "clusters" according to the scores, and looked for institutional similarities in countries with similar scores. The data was based on national statistics and acconting data, and survey data, mainly from the European Working Conditions survey. The survey data covered the area of percieved job satisfaction and other subjective measures. To compare Norwegian data with this analysis, I have used data from EUROSTAT and Statistics Norway. I will also look at the development of these indicators over the last 10-15 years where the data allows it. Because of limitations of existing data in Norway, some of the indicators used in the survey are not covered.

Main Findings

Educational level

Norway has got one of the highest levels of public expenditure on education as a percentage of GDP. As seen from the data, the nordic countries has generally got the highest amount of expenditure, and Cyprus also uses a high share of the GDP. Only Denmark has got a higher expenditure per pupil/student than Norway.

Figure D1: Total public-sector expenditure on education (ISCED 0 to 6) as a percentage of GDP, 2006



	EU-27	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	IS	LI	NO	TR
2001	5.0	6.0	3.8	4.1	8.4	4.5	5.3	4.3	3.5	4.2	5.9	4.9	5.9	5.6	5.9	3.7	5.0	4.5	5.1	5.8	5.4	5.6	3.3	5.9	4.0	6.0	7.1	4.6	6.2	:	7.2	2.7
2002	5.1	6.1	4.0	4.3	8.4	4.7	5.5	4.3	3.6	4.3	5.9	4.6	6.6	5.7	5.8	3.8	5.4	4.4	5.2	5.7	5.4	5.5	3.5	5.8	4.3	6.2	7.4	5.1	6.8	3.0	7.6	2.8
2003	5.1	6.1	4.2	4.5	8.3	4.7	5.3	4.4	3.6	4.3	5.9	4.7	7.3	5.3	5.2	3.8	5.9	4.7	5.4	5.6	5.4	5.6	3.5	5.8	4.3	6.4	7.3	5.2	7.7	2.5	7.5	3.0
2004	5.1	6.0	4.5	4.4	8.4	4.6	4.9	4.7	3.8	4.3	5.8	4.6	6.7	5.1	5.2	3.9	5.4	4.8	5.5	5.5	5.4	5.3	3.3	5.8	4.2	6.4	7.2	5.2	7.5	2.4	7.5	3.1
2005	5.0	6.0	4.5	4.3	8.3	4.5	4.9	4.8	4.0	4.2	5.7	4.4	6.9	5.1	4.9	3.8	5.5	6.8	5.5	5.5	5.5	5.4	3.5	5.7	3.9	6.3	7.0	5.4	7.6	2.3	7.0	:
2006	5.1	6.0	4.2	4.6	8.0	4.4	4.8	4.9	:	4.3	5.6	4.7	7.0	5.1	4.8	3.4	5.4	:	5.5	5.4	5.3	5.3	:	5.7	3.8	6.1	6.9	5.5	7.6	2.1	6.6	2.9

Source: Eurostat, UOE and National Accounts (data extracted June 2009).

The general, educational level in Norway is very high, and over 30% of the adult

population has some form of higher education, and less than 30% has only primary education[14] With the increase in the general educational level, and the great reduction in unskilled labour, your career is to an increasingly larger degree decided by your initial educational level.
In general, the Northern and East European countries had high scores in relation to educational levels and educational expenditure, in the Nordic countries this corresponds well to the idea that Coordinated Market Economies will have an extensive educational system and vocational training in order to supply the labour market with high-skilled labour. The lowest educational levels were found in the Southern European countries. The rest of the Continental Europe had an "average" distribution of higher and lower education.

Income

"Working poor" are defined as individuals who are working, but still are at risk for poverty after social transfers. A high level of working poor indicates low employment quality. In Norway, 6% of the persons employed are at risk of poverty after social transfers. This is below the EU-27 average which is 8%. The highest levels of working poor are found in the Mediterranean area and in some Eastern European countries such as Romania (18%) and Poland (12%). Norway perfoms about the same on this measure as the other Nordic countries. Since these data are based on at-risk for poverty after social transfers, the generous welfare system in the Nordic countries may reduce the number of working poor, in comparison to the Mediterranean countries. The new EU countries have a higher share of unskilled low-wage jobs with poor career possibilities. The continental EU countries have some part time employed labour, but a small degree of working poor.

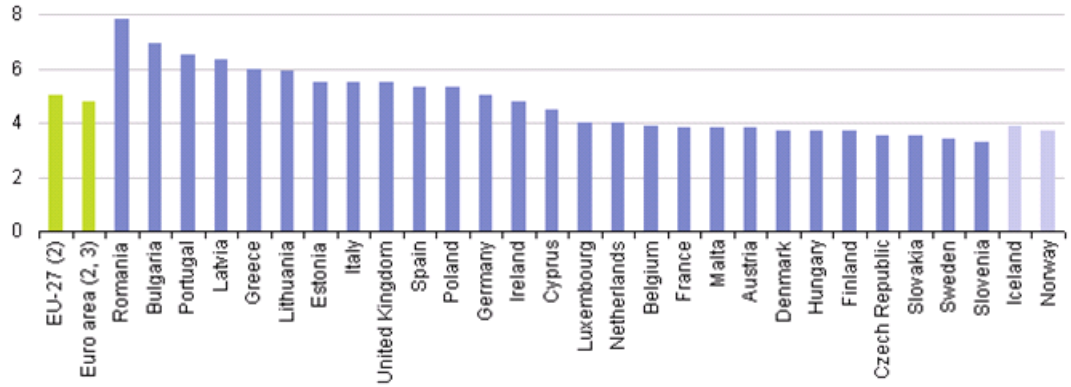
Wage Inequality

When we consider the wage inequality, we look at the ratio of the top and bottom 20% of the income distribution, with the equivalized disposable income [15]. The

[14]Education at a glance,OECD,2009

[15]The equivalized disposable income is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members as equalized (made equivalent) adults. They are made equivalent as each is weighted according

Eastern European and Mediterranean countries have the highest levels of income inequality, followed by continental Europe, and the Nordic countries together with Eastern European countries.



(1) The income reference period concerns the year preceding the survey year for the majority of countries.
(2) Eurostat estimates based on population-weighted averages of national data.
(3) EA-15 instead of EA-16.

Source: Eurostat (ilc_ov2)

It has also been suggested that bargaining centralization, female labour-force participation and government employment have different effects with respect to the effect of wage inequality in LMEs and CMEs (Rueda and Pontusson, 2000) . This implies that policies successful in LMEs might fail in CMEs and vice verca.

Working conditions

Some of the indicators influencing working conditions, are indicators such as work-related stress, uncomfortable working posititons, involuntary part-time work, wage levels and career opportunities. I will cover all of these briefly.
Workers in Norway are covered by the Agreement on Working Conditions. When looking at data measuring physical working environment problems, the numbers of people needing medical attention because of their working environment has been greatly reduced in the last 10-15 years[16]. In general, there are low reported levels of uncomfortable working conditions in Norway and in the Nordic countries, these are most common in the new EU countries and Greece. One notable exeption to this is the reported level of work-related stress. Work-related stress is associated

to their age using the so-called modified OECD equivalence scale

[16]See Appendix

with low work satisfaction in all the non-Nordic countries, but in the Nordic countries, the reported level of job satisfaction is high despite of the high level of stress. Intensifying working conditions are negatively related to employment quality, but not in the Nordic countries.

Gender Employment Gap

Norway has one of the highest female labour participations in the world. The general tendency in the Nordic countries is to have larger differences between men and women inside of the labour market (more wage inequalities), but much more gender equality in employment. This is not a surprising result, considering that Mediterranean countries are characterized by the fact that women with lower levels of educations stay out of the labour market. This contributes to large gender differences in employment, but small gender differences in wages since the female labour force is generally higher educated.
The gender employment gap in Norway has decreased gradually over the time period. However, the effect is not only due to an increase in female labour market participation, but also a reduction of male labour market participation.

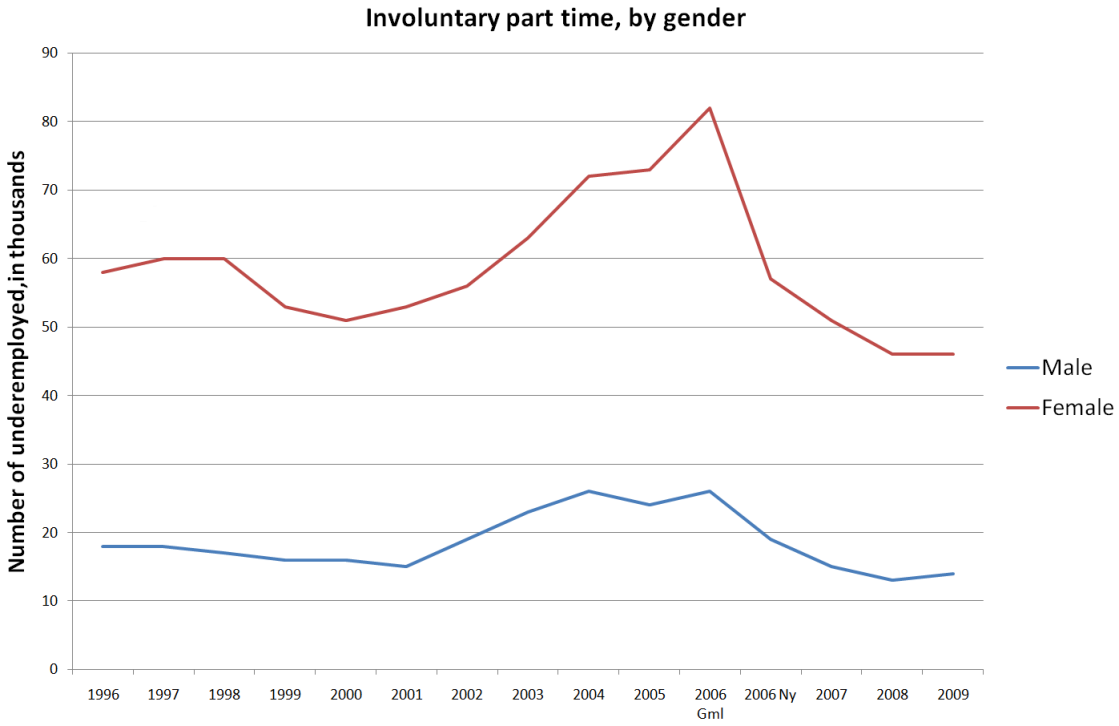
Source: Statistics Norway

Gender Unemployment Gap

The gender unemployment gap is relatively small in Norway. After 1999, both female and male unemployment increased, but the male unemployment increased at a higher rate. After 2005, the rates became more similar again, but after the financial crisis, there seems to be another divergence.

Involuntary part time, by gender

Involuntary part time by gender is much larger for women than men. One possible explaination for this is that more women than men are employed in the health sector of the economy, which has a higher degree of part-time positions available than other industries.



Source: Statistics Norway

Age inequalities in the labour markets

To consider the possibilities of inequalities in age in employment, I looked at EUROSTAT data.

The main conclusion following the survey was that the differences in employment quality to a large degree originated in differences between the institutions in the different countries. An important reason for this is that changes in the same indicators (such as work-related stress, or work intensity) yielded very different results in relation to job satisfaction. The strong correlation between employment rates and employment quality, does not imply that there is a trade-off between number of jobs and employment quality, at least in the EU-15.

Limitations

There are some methodological difficulties with the way the survey has been done. Some questions may also have been interpreted differently in different countries and cultures, especially the different subjective parameters, such as workplace related stress. Some indicators may also have some political motivation. Indicators about workplace injuries etc. are based on the changes from year to year instead of absolute numbers.

3.7 Employment Quality and Job Performance

Employer-provided training and lifelong learning are usually thought to increase employment quality. The collective agreement focuses on the right to work related training, and workforce skills and training are known to be positively related to productivity performance at sector and firm level. A high turnover in the industry, another possible indicator for less influence and cooperation, are also naturally negatively linked to workforce training. The workers have reduced incentives to gain work-spesific skills, and employers may be reluctant to invest in an "unstable" workforce. The extreme case is japanese firms which hire some people for the rest of their working life, therefore eliminating the incentive problem and the risk connected to investing in workforce training. This leads to a large openness to new technology from the workers point of view since their jobs will never be threatened by technological progress (Katz and Darbishire, 2000).

Functionalist organizational theory supports the idea that work autonomy covaries with the skill level of the workers. If a high level of skill is connected to a larger degree of worker autonomy, lower-skilled countries will have less autonomy. However, large surveys comparing skill levels and autonomy find cross-national differences (Dobbin and Boychuk, 1999).

A literature review of the correlation between job satisfaction and job performance at individual level when combining qualitative and quantitative studies on the area, found a significant relationship between these variables at 95% level (Judge et al.,

2001). Earlier meta-analyses has concluded with smaller correlations, such as Michelle T. Iaffaldano and Paul M. Muchinskys influential article which concluded that the correlation between satisfaction and performance were low (.17) and that much of the variability in the data were due to small sample sizes and unreliable measurements (Iaffaldano and Muchinsky, 1985). As a result of this, there were a decline in the number of published papers on job satisfaction in the 90s and a declining interest in work satisfaction as a field of study. However, a later meta-analysis on job satisfaction found a true correlation between job satisfaction and job performance by 0.30 which were statistically significant (Judge et al., 2001).

These kinds of studies has also been carried out at business level. A study conducted based on 7,939 business units in 36 companies, looked at different aspects of employee satisfaction, and generalizable relationships were found between unit-level employee satisfaction and business-unit outcomes. The different measures were consumer loyalty, profitability, employee turnover and safety variables. The main hypothesises were that business-unit satisfaction and engagement would have positive effects on the business-unit outcomes, and that these correlations would generalize across organizations for all the business-unit outcomes. The Gallup survey consisted of one overall satisfaction measure, and 12 other satisfaction measurements including cooperation, feeling of importance and meaning at work, degree of positive recognition and so on. The satisfaction data were aggregated at business-unit level and correlated with the different performance measures. All of the performance variables showed positive correlation with the satisfaction measures, but profitability and productivity were higher correlated than the other variables. [17]. This might imply that improving employee satisfaction may increase business unit outcomes, including profits (Schmidt, 2002).

3.8 Institutional Sustainability in Norway

"To allow the market mechanism to be sole director of the fate of human beings (..) would result in the demolition of society."
Karl Polanyi - The Great Transformation

[17] The methodological difficulties with perception studies are further discussed in the discussion section

Another important issue is the sustainability of the Norwegian work practices. Institutions supporting cooperation, coordination and representative participation are not guaranteed to survive. There is a widespread belief that globalization would lead to convergence in political economic systems, where neo-liberalism would be the only competitive alternative. In that case, globalization would lead to institutional changes in coordinated economies.

The idea of institutional convergence is not new. There has been a widespread "common knowledge" that increased openness in markets and international trade would lead to institutional convergence in the countries open for trade. This has motivated a widespread anti-globalization movement in order to secure the welfare state, environmental quality and job security. Anti-corporatist ideology has also motivated globalization resistance.
The view on institutional convergence is often similar to the "Race to The Bottom hypothesis". The supporters of the "Race to The Bottom" hypothesis argue that in order to accomodate global capital, the national states have to stay competitive in the capital market by reducing taxes on capital, and reducing og removing environmental and labour protection. The capital holders would have the ability to perform "institutional arbitrage". Another hypothesis focuses on the possibility of policy convergence as an effect of supranational institutions and transnational governance (Drezner, 2001).

Another possibility is that instead of institutional convergence, there are actually divergences between countries in order to accomodate different parts of the world market or production. Using the varieties of capitalism approach to institutional change, I will argue that changes in the Norwegian institutional structure would have to come from mutually beneficial improvement. Because of the codependence of the different institutions, and the possibilies of institutional complements, changing a single one of them would not neccesarily be beneficial. The empirical evicence of policy convergence in globalized economies is weak, and some of the literature suggests that the different countries actually diverge in their policies and modes of production, in order to take advantages of any institutional advantages **?**.

The union power has an effect on public policy and firm behavior. There are large differences in Europe in regards to the influence of the trade unions, and they are not neccesarily correlated with the share of union members in the workforce. One example of this is France, where only 8% of the working population are members of a trade union, but the trade unions in France have substantial power, and union leaders are frequently consulted on public and work policy issues. Deliberative institutions such as cooperation between unions and employer organizations which makes collective wage bargaining possible, are not as attractive if they are not accompanied by other national characteristics such as strong unions. In liberal and deregulated labour markets, deliberative institutions are not necessary to ensure a good outcome, and it is therefore not especially important. Changing a single institution would therefore not guarantee to lead to a Pareto improvement (Hancke, 2009).

4 ERAMET-Norway

In this section I will present the case of ERAMET Norway, a manganese production company, which has three factories in Norway. ERAMET Norway has a flat organizational structure and has focused on cooperation between employees and the management on all levels. I conducted interviews with the CEO of the company, Odd Husmo, the leader of the local union, and also with a shift cooperator, and a production manager.

In 1999, the french mining company ERAMET Comilog bought two manganese raffineries from ELKEM, one in Sauda, and one in Porsgrunn. Odd Husmo continued working as CEO of the factory in Porsgrunn and also became CEO of the factory in Sauda. ELKEM sold out because of the lack of access to cheap raw materials, whereas ERAMET extracts its own raw materials from their mines in Gabon.

4.1 Management Philosophy

ERAMETs management philosophy is based on the X and Y theory by Douglas McGregor, which is based on two different views of management, namely Theory X and Theory Y.

Theory X

This form of management focuses on close supervision of workers on all levels, motivated by a view of workers as lazy and unproductive. The sole motivation of workers is money, which in many ways does not differ greatly from the way economists view working. Workers left alone will shirk, and also avoid responsibility if they can. As a consequence, the tasks that the workers are supposed to do have to be narrowly defined and easily controlled and measured. This type of management needs a hierarical organization with many levels, and delegation and innovation and ideas of improvement are provided downwards from the management. This form of management may somewhat resemble the standard Taylorist production. It has also been shown that there is a correlation between a level of trust in a society, and the degree of workers discretion (Arundel et. al., 2007). This is not surprising according to the X/Y theory, as distrust is seen as one of the main motivations for hierarchy and control.

Theory Y

This management style is based on the view that workers may have other motivations than just their salary, and that they will, even in the absence of direct supervision, impose self-control and do what is asked of them. This implies that the workers have to accept more responsibility for their own actions. Because of workers discretion, there is a substantial degree of innovation upwards, where the workers find better ways of performing their tasks and/or increasing the quality of their product.

4.2 Employee Participation

Board Representation

ERAMET Norway has eight board members, where four are representatives from the owner side, which includes the chairman of the board, three are employee representatives and one is a so called "local resource". The employee representatives include two representatives from the unions (the leaders of the industry and energy branch of LO in Sauda and Porsgrunn, respectively) and one white-collar representative. The white-collar representative is locally elected in the Porsgrunn and Sauda factory every two years, and the two factories take turns in having their representative at the board of directors.

BU meetings

As given from the Basic Agreement part 2 – The Cooperation Agreement, all firms covered by the agreement with over 100 employees are obliged to arrange works-council(BU) meetings. [18] The objective of these meetings is to provide information about the firm, which includes strategy plans, financial situation and so on, and the meetings have no desicion making power. In agreement with the local union, the frequency of these meetings have been reduced because of the efficient flow of information within the firm, and the BU meetings are used as an arena to present more long-term goals and discuss spesific issues instead.

Daily Operator Meetings

In addition to the board, BU and AMU meetings, ERAMET Porsgrunn also has daily operator meetings, where the daily production is discussed, tasks are delegated and where problems related to the last day's production, maintenance needs and so on are discussed. The meetings are open to everybody who wants to contribute with something. In addition to this, the operators of each shift have a meeting with their supervisor once every five weeks (Shift meetings).

[18] Works councils are more generally discussed in section 2.

4.3 Production

Autonomous work groups are used in the entire production. The plant operates 24 hours a day, but the management is only present at daytime. The rest of the workers are spread on 5 different shifts throughout the day, with 13 employees at each shift. 11 of these employees are employees at ERAMET, and 2 are external. Every shift has one coordinator which deals with job rotation inside the shift, sick leaves and substitutes, and also some conflict management. The coordinator also reports to the director, which does not interfere with the team unless they explicitly ask for it. Every operator has the possibility of applying for the coordinator position, and this position is filled biennialy.

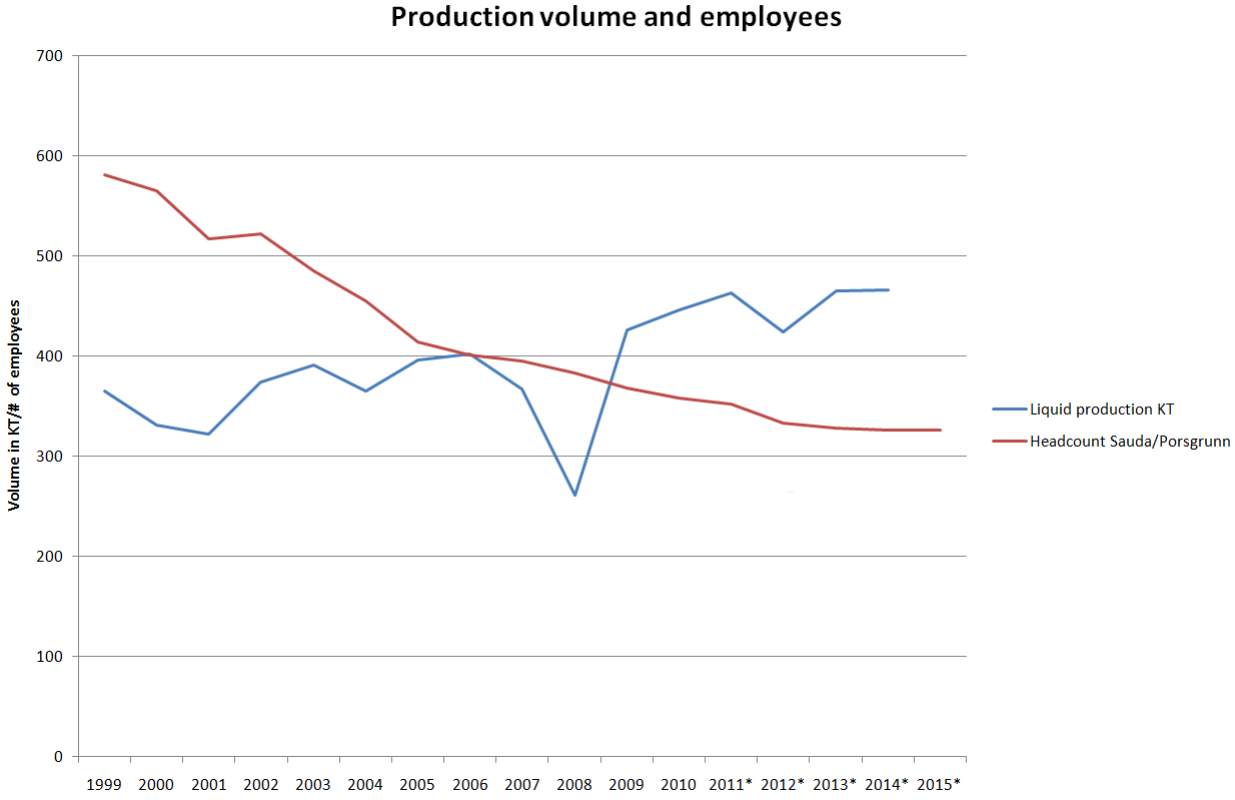
Multiskilling and multitasking is performed at some level. Even though the factory does not have many workers with vocational training in more than one vocation, there are six different tasks on each shift, and the workers are supposed to be able to do at least three of them[19]. In practice, however, this is not always followed through, as some of the workers, especially older workers who have done the same tasks for a long number of years, often are less interested in task rotation, and the degree of rotation is decided by the shift coordinator.
The LEAN management theory which is dominant in several industries, has also influenced the ERAMET production structure. The idea of standardizing some procedures is essential. "The production is more specialized now than it has been before, with the same production inputs. So we have definitely become more productive."
-Torgeir Larsen

Productivity

As seen from the figure below, the headcount in the factories in Sauda and Porsgrunn steadily decreased from 1999 to 2001. ERAMET Comilog demanded a restructuring of the production process in order to increase profitability. This restructuring was done by offering voluntary redundancy to employees. This practice

[19]Raskere, høyere, sterkere - Ledelse for okt produktivitet - Utredning for Norsk Industri: Kompetanse og arbeidsliv 2008

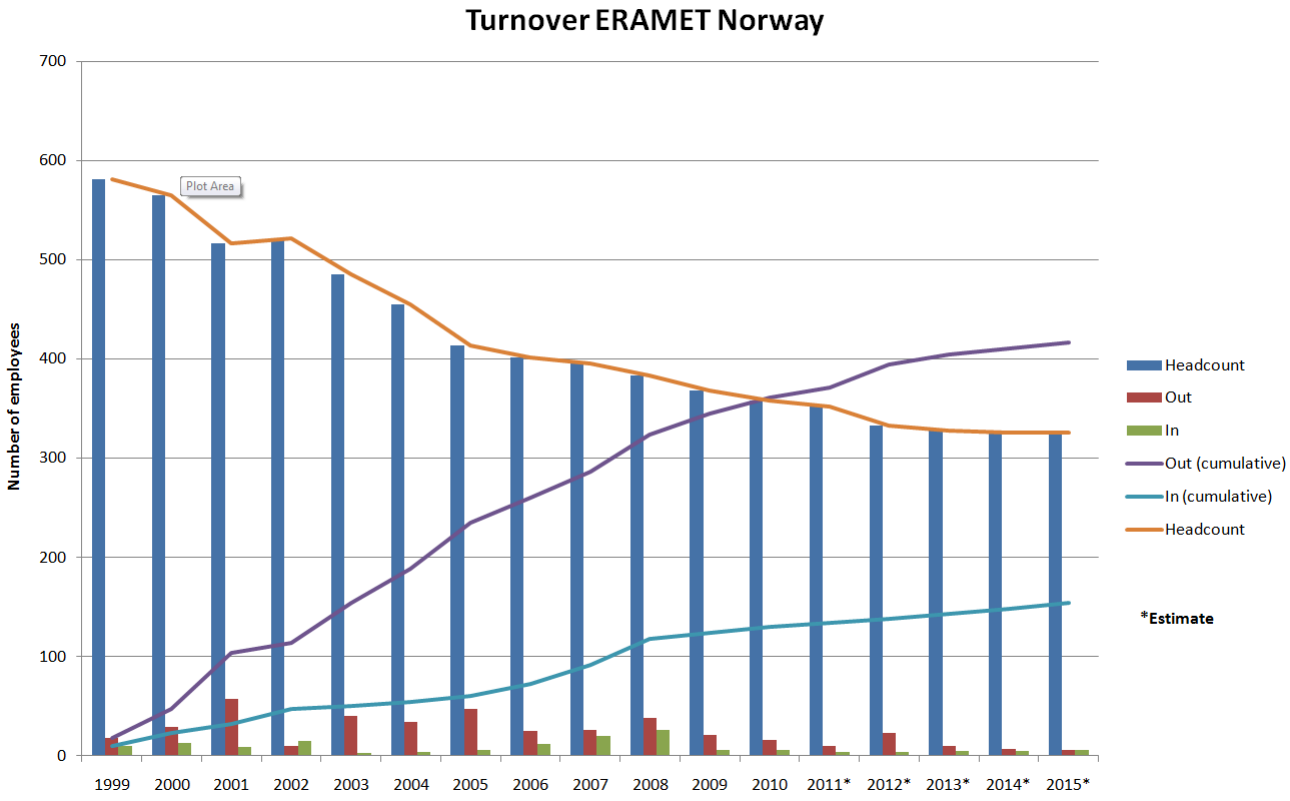
was done in cooperation with the local union, which agreed to participate in the restructuring as long as there would not be any involuntary lay-offs. Because of the implementation of more advanced work practices, new workers were hired every year to meet the increased need for highly qualified workers. After the financial crisis, demand for manganese plummeted. ERAMET Porsgrunn and Sauda shut down some of their production, and the work hours were reduced by 50% for most of the employees.



Employee turnover and downsizing

After the Porsgrunn and Sauda factory were bought by ERAMET Comilog, the factories faced a serious restructuring process. The number of workers should be approximately halved, together with large investments in equipment and capital from the French owners. The LEAN model of structurization, standardization and teams was implemented in order to ensure cost control. ERAMET managed to increase their liquid production, while reducing their headcount significantly as

seen on the productivity figure.



Education level, and training in the workplace

"When it comes to employee training, it is possibly our weakest point" - Odd Husmo.
The majority of the operators at ERAMET Porsgrunn have vocational training (approximately 70%). The operators without training are offered subsidized vocational training. 2-3 operators also have tertiary education. In the control rooms, vocational training is a requirement.

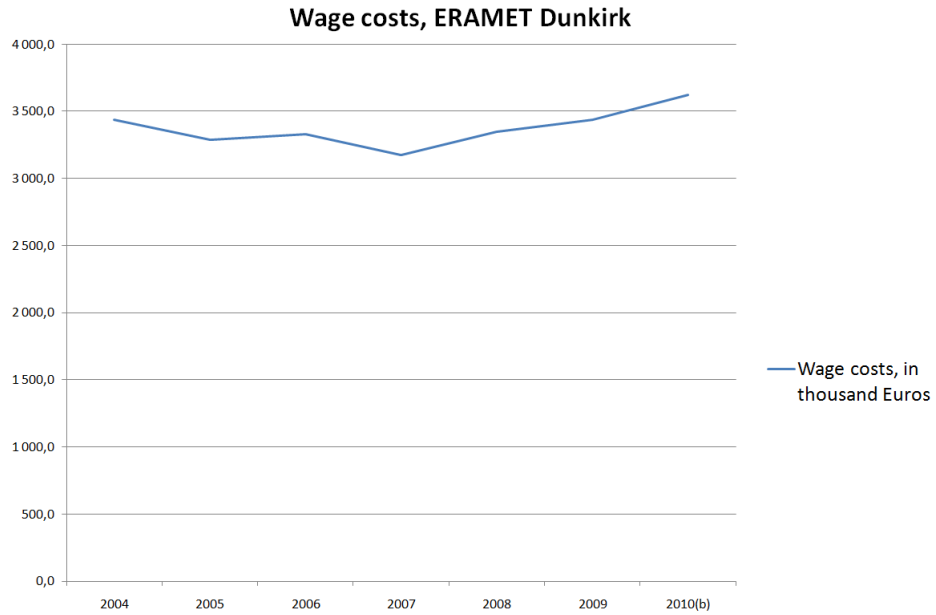
Wages

The base level wage for vocationally trained operators in ERAMET Norway in 2010 is 33753 NOK every month. But there are some differences in wages between the operators, according to level of education and responsibilty. Operators with coordinator responsibilities earns an additional 14 000 NOK, and operators with

responsibility in case of an emergency recieves an additional 9000 NOK every month. "We had some cases where workers with the same responsibilities and work descriptions recieved different wages. Both the workers involved and the rest of the firm wanted to get rid of this inequality, and we managed to solve it so these kind of differences disappeared. Even though there are some wage differences between the operators, issues in regards to differences in status and prestige are non-existent. All the operators have the same status, if they are crushing stone, melting it or getting it ready for shipment" -Torgeir Larsen, Local union leader.

4.4 The Story About the ERAMET Comilog Factory in Dunkirk

The manganese factories in France have a completely different approach to management and work practices than ERAMET Norway. French working life in general is more hierachically structured (3-4 levels from the bottom to the top). Employees have little influence over management decicions, in board meetings decisions are seldom made, they are made by the CEO in his office after the meeting, and announced afterwards. In addition to the manganese factories in Sauda and Porsgrunn, ERAMET Comilog had one factory in the US and two factories in France, one in Dunkirk and one in Bologne. The Bologne factory was shut down in 2004, but the Dunkirk factory is still running. As "restructuring in the form of reduncancies and similiar efforts are not heard of", the Dunkirk factories had to find other ways of cost control in the times of difficult market conditions. The solution was to stop the increase in wages, and no redundancies have been made, with the exeption of in 2009 (see Appendix). This is made possible because of the high levels of unemploymemt. However, the cost of this is social unrest and difficult working conditions, and the conflict level is high in the fac-



tory.

Although ERAMET Norway have been laying people off, the union have been cooperative in this process under the one condition that no one was laid off involuntarily. The ongoing dialogue between both union, workers and management both informal and in BU and AMU meetings increases information flows and reduces tension. [20]

5 Summary

In this section I will summarize the most important characteristics of working life in Norway described in the thesis, and also look at how the relevant literature answers the following questions: How does the institutional structure in Norway influence working life? Is the "Nordic model" with high levels of participation and cooperation linked to higher productivity and/or employment quality? And are the Norwegian institutions sustainable?

I first looked at different kinds of institutions as a way of resolving coordination problems. The Varieties of Capitalism approach suggests that you will find

[20] The content of this subsection are my own reflections from my interviews conducted with Odd Husmo, in addition to the supplied data.

differences in production and innovation across countries because of institutional differences. I found that collective bargaining and representative participation influences work practices. Wage compression following collective wage agreements reduces inequality in income and wages both for men and women, in addition to special agreements regarding gender equality. The cooperation agreement states that the enterprises are responsible for supplying work related training and education if necessary. This implies that the institutional structure in the labour relations have has a positive effect on employment quality, and facilitates production with great autonomy and with highly skilled workers.

How does work practices connected to participation such as worker autonomy, self-directed teams and representative representation contribute to employment quality? Autonomy in the workplace decreases stress and increases skill development, which contributes to higher employment quality. When looking at data, I find that Norway has similar characteristics as the other Nordic countries on employment quality indicators such as educational level, gender equality in the labour market (although there is a large gender segregation between different sectors), and wage inequality. They are also similar with regards to having have a high level of work intensity which is not associated with low work satisfaction. In general, Norway is characterized by high-quality jobs and high employment satisfaction, and is similar to the other Nordic countries with similar institutional structures.

Meta-studies looking at the correlation between job satisfaction and job performance find a positive relationship between the two variables. However, the impact of job satisfaction and the views on how reliabile the different studies are, vary. Because the studies are cross- sectional, it limits the possibilities of saying anything about the causal relationships between these two variables. In addition, some of the data regarding productivity gains of implementing new work practices are self-reported, such as supervisors rating of performance, which has a tendency to overrepresent the effects caused by changes in work practice.

Participation and cooperation have a positive effect on the quality of employment in the economy. However, the success of a single institution may depend on the existence of other institutions in the economy. Existence of institutional com-

plementarities increases the sustainability of successful institutions when facing challenges such as globalization and demographic changes, but it may also limit the benefits of introducing successful work practices or institutions in countries with different institutional structures due to the lack of possible institutional complementaries.

Self-directed teams and teamwork in itself is is not a guarantee for high-quality employment in general. As seen in the Tayloristtic and LEAN production models, the ppresence of team work alone does not necessarily imply worker's discretion or a higher levels of on-the- job training. When considering the possibility of institutional convergence due to globalization, the evidence for a convergence in work practices is weak, and institutional advantages as discussed in section 2.2. may actually lead to a divergence between countries because of specialization on production which utilizes the institutional advantages.

When considering the qualitative comparison between ERAMET Norway and ERAMET France, I found considerable differences in how the production process was organized, even though the end product from both factories was very similar. Because of differences in both cooperation opportunities with unions and the human capital available for the management, two similar factories have chosen very different models with went in very different directions in regards to work practices. This illustrates how Norwegian (and Nordic) work life is often characteristically different from other work life with regards to cooperation, participation and employment quality.

6 APPENDIX

§ 12.8 Works council activities The main task of the works council is, through cooperation, to work for the most efficient production possible and for the maximum wellbeing of all who work at the enterprise. In enterprises that have joint works and working environment councils, the council shall handle, in addition to the statutory duties of working environment committees, the following areas of work that otherwise would pertain to the works council. A practical division of the work must be arranged if both separate councils are maintained.

The fields of activity are:
Informative and confidential reports from the management on the financial status of the enterprise and of its standing in the industry, as well as on other matters of importance for production and sales conditions.

In this connection, financial information shall be provided in writing to the same extent as it normally is given to shareholders through the financial statement submitted at a company's annual general meeting. When so requested by council members, opportunities shall be provided for reverting to the accounts at a subsequent meeting of the council.

Matters that are of material importance for the employees and their working conditions which relate to the activities of the enterprise, substantial investments, changes in systems and methods of production, quality, product development, plans for expansions, reductions or restructuring, shall be submitted to the council for its opinion before any decision is made.

Reports on the activities of the enterprise and any existing plans for operations in the immediate future.

Such reports shall be provided and discussions shall take place at the earliest opportunity, to enable the council to deliver its opinions soon enough to influence the final decision.

If matters as mentioned in this section are to be dealt with by the board of directors or corporate assembly of the enterprise, the council's statement shall be included with the relevant documents, unless lack of time has made it impossible to obtain such a statement.

The council shall work for sound and proper rationalization. By work to provide information, it shall promote understanding of the great importance rationalization has for the community and for the enterprise.

The council has the authority and the responsibility to establish such general guidelines as its members may agree on for vocational training for the employees of the enterprise. The same applies to guidelines for new employees. Moreover the works council can Within a fixed budgetary limit, the management may give the council authority and responsibility for implementing safety measures. This does not limit the decisionmaking powers of the working environment committee under the Working Environment Act.

Within a fixed budgetary limit, the management may give the council authority and responsibility for implementing social welfare measures. The management shall deal as soon as possible with matters on which the council has given an opinion, and shall inform the council of its decision at the next meeting of the council.

When the matters referred to in paragraphs 2 through 9 of this section are being discussed, information given by the enterprise shall be kept absolutely secret to the extent enjoined by the management.

The works council itself should concentrate on work and measures of a general nature relating to the enterprise as a whole or to large sections of it. Otherwise as far as possible the council should delegate authority and responsibility to the departmental councils in matters which can be decided at departmental level.

At Risk For Poverty After Social Transfers (2008)

	Total population	Persons employed
EU-27	16	8
Belgium	15	8
Bulgaria	20	4
Czech Rep.	8	6
Denmark	12	3
Germany	15	4
Estonia	20	7
Ireland	17	8
Greece	20	6
Spain	19	14
France	12	11
Italy	19	6
Cyprus	16	10
Latvia	21	6
Lithauania	18	8
Luxembourg	12	9
Hungary	10	6
Malta	13	4
Netherlands	9	5
Austria	11	6
Poland	15	12
Portugal	17	10
Romania	23	18
Slovenia	11	5
Slovakia	9	5
Finland	13	5
Sweden	10	7
United Kingdom	18	8
Croatia	N/A	7
Iceland	9	7
Norway	12	6

Working Conditions

	1989	1993	1996	2000	2003	2006
Utsatt for sterk varme, *	7	7	6	4	4	4
Utsatt for sterk kulde, *	8	8	8	8	7	8
Utsatt for dårlig inneklima, *	:	:	:	34	32	28
Utsatt for støv, gass eller damp, *	16	18	14	9	13	8
Utsatt for hudirriterende stoff, *	10	9	8	7	7	8
Utsatt for vann på huden flere ganger i timen	:	:	:	:	16	16
Utsatt for dårlig arbeidslys, *	7	8	8	6	6	4
Utsatt for passiv røyking, *	12	12	7	6	5	3
Utsatt for sterk støy, *	8	9	8	8	7	5
Utsatt for vibrasjoner, *	6	6	8	6	5	4
Arbeider så hardt at du puster raskere *	:	:	:	:	8	7
Sitter på huk/står på kne *	8	8	10	6	8	8
Står eller går *	55	53	57	53	55	54
Må løfte i ubekvemme stillinger *	:	:	9	8	6	7
Arbeider med hendene løftet *	10	10	10	8	8	8
Arbeider i framoverbøyd stilling utan støtte *	12	11	10	10	9	4
Arbeider i andre stillinger som belaster ryggen *	14	13	13	14	:	:
Arbeider med gjentatte eller ensidige bevegelser *	34	33	35	36	36	38
Arbeider sittende to timer el mer uten å kunne reise seg, strekke på bena	:	:	10	:	4	3
Løfter minst 20 kg 5 eller flere ganger daglig	18	16	17	15	14	13
Løfter minst 10 kg 5 eller flere ganger daglig	:	:	23	21	19	20
Stor risiko for arbeidsulykker	:	:	7	6	6	6
Stor risiko for belastningsskader	:	:	22	20	25	21
Stor risiko for andre helseplager	:	:	9	6	8	6
Antall sysselsatte	4436	3818	2135	2536	2561	9961

* = mesteparten av tiden = 'nesten hele tiden', '3/4 av tiden', 'halvparten av

tiden'. Source: Statistics Norway

Unemployment , in 1000 persons, by gender

	Men	Women
1996	58	50
1997	48	44
1998	39	35
1999	41	32
2000	46	35
2001	46	38
2002	52	41
2003	62	45
2004	62	45
2005	61	49
2006 Gml	46	39
2006 Ny	45	39
2007	34	29
2008	38	30

Source: Statistics Norway

Unemployment , in 1000 persons, by gender

	Men	Women
1996	18	58
1997	18	60
1998	17	60
1999	16	53
2000	16	51
2001	15	53
2002	19	56
2003	23	63
2004	26	72
2005	24	73
2006 New	19	57
2007	15	51
2008	13	46
2009	14	46

Source: Statistics Norway

Labour Market Participation, as Percentage of Total Population

	Men	Women
1996	76,6	65,8
1997	77,7	67,2
1998	78,4	68,2
1999	78	68,6
2000	77,9	68,8
2001	77,8	69,1
2002	77,4	69,6
2003	76,7	69,1
2004	76,3	68,8
2005	76,2	68,7
2006 New	75,6	68,4
2007	76	69,5
2008	77,1	70,7
2009	75,6	69,8

Source: Statistics Norway

Collective Agreements in Europe

	Collective Agreements	Proportion of Workforce in Trade Unions
Austria	Yes, 80%	47%
Belarus	No	80-90% (0)
Belgium	Multilevel within private sector (90%)	60%
Bulgaria	Yes, weakly adhered to	18% (1)
Croatia	Bargain in good faith	50%
Cyprus	Not legally enforcable and limited to Northern area	2% / 60% (2)
Czech Rep.	Yes, company agreements	14-15%
Denmark	Yes (85%)	75%
Estonia	Yes (15%)	10%
Finland	yes - widespread	80%
France	yes - multilevel - (90%)	8%
Germany	Yes (67%)	23%
Greece	yes	30%
Hungary	Yes (40%)	23%
Iceland	Yes (95%)	82%
Ireland	yes - widespread	33% (3)
Italy	yes - widespread	30%
Latvia	Yes - company and sector level	20%
Lithauania	Few - and mainly at workplace level	10%
Luxembourg	Yes	50%
Malta	Yes	63%
Moldova	Yes - enterprise level	40%
Norway	yes - widespread and effective	55%
Poland	Yes - company level mainly	14% (4)
Portugal	Yes - widespread at all levels	30%
Romania	Yes - mainly public sector	40%
Russia	Yes - only one permitted per enterprise	50% (5)
Slovakia	Yes (mainly sectorial)	10%
Slovenia	Yes - extensive	35%
Spain	Yes (85%)	15%
Sweden	Yes - widespread	80%
Swizerland	Yes (50%)	25%
Ukraine	Yes -national agreements sectorial level	66%
United Kingdom	Yes - almost wholly at plant/company level private sector	26% / 17% (6)

On-the-job training in Europe

	Training enterprises (as % of total enterprises)	Cost of CVT courses (% of total cost)	Average time spent in CVT courses per employee (hours)
EU-27	60	1,6	9
EU-25	61	1,6	9
Belgium	63	1,6	12
Bulgaria	29	1,1	4
Czech Republic	72	1,9	14
Denmark	85	2,7	10
Germany(1)	69	1,3	9
Estonia	67	1,6	7
Ireland	67	2,2	12
Greece	21	0,6	3
Spain	47	1,2	9
France	74	2,3	13
Italy	32	1,2	7
Cyprus	51	1,3	7
Latvia	36	0,8	4
Lithuania	46	1,2	5
Luxembourg	72	2	16
Hungary	49	1,9	6
Malta	46	1,8	11
Netherlands	75	2	12
Austria	81	1,4	9
Poland	35	1,3	6
Portugal	44	1,1	7
Romania	40	1,1	5
Slovenia	73	2	14
Slovakia	60	1,8	12
Finland	77	1,5	10
Sweden	78	2,1	15
United Kingdom	90	1,3	7
Norway	86	1,3	9

(1) (including ex-GDR from 1991)

Operating result, Liquid Production, Investments and Activity Costs ERAMET NORWAY

	Operating results (MNOK)	Liquid production KT	Investments (MNOK)	Activity costs (MNOK)
2000	199	365	64	513
2001	90	331	80	512
2002	-73	322	60	484
2003	251	374	58	478
2004	1046	391	101	523
2005	560	365	143	508
2006	347	396	85	508
2007	1014	402	112	521
2008	3035	367	217	558
2009	-904	261	51	481
2010	574	426	103	600
2011 (est)	457	446	258	618
2012 (est)	391	463	224	613
2013 (est)	394	424	149	627
2014 (est)	440	465	102	641
2015 (est)	376	466	129	654

Turnover ERAMET Norway

	Headcount	Out	In
1999	581	18	10
2000	565	29	13
2001	517	57	9
2002	522	10	15
2003	485	40	3
2004	455	34	4
2005	414	47	6
2006	401	25	12
2007	395	26	20
2008	383	38	26
2009	368	21	6
2010	358	16	6
2011(est)	352	10	4
2012(est)	333	23	4
2013(est)	328	10	5
2014(est)	326	7	5
2015(est)	326	6	6

Operating Result, Production and Turnover ERAMET Comilog Dunkirk, France

	2004	2005	2006	2007	2008	2009	2010
Salaires	3 434,3	3 290,0	3 331,0	3 174,8	3 344,7	3 437,2	3 619,8
Participation	597,0	478,4	97,0	526,0	689,7	0,0	91,0
CAP / Salaires	-29,7	-48,4	-13,6	28,3	7,5	-19,2	0,0
Intérim	276,2	185,5	243,0	358,6	322,9	116,4	100,0
Total frais de personnel	4 277,8	3 905,4	3 657,4	4 087,6	4 364,8	3 534,4	3 810,8
Personnel détaché	0,0	0,0	0,0	0,0	0,0	24,0	0,0
Autres frais de personnel	90,9	117,9	121,6	122,0	163,7	144,2	185,0
Entretien courant	862,5	767,9	805,4	806,6	935,0	868,9	800,0
Gros entretien	832,0	582,5	752,7	889,6	569,8	500,9	600,0
Autres	561,2	585,9	613,5	616,9	694,3	576,9	674,4
Macofa	326,5	288,5	353,3	332,8	392,1	315,4	309,0
Location	598,2	452,1	525,9	596,1	595,0	535,1	533,9
Recherche et Developpement	136,2	117,5	107,1	102,6	219,7	199,3	150,0
Sous-traitance	350,6	336,3	306,4	299,5	357,1	218,8	231,0
Sous-total	8 035,9	7 154,2	7 243,4	7 853,7	8 291,5	6 917,8	7 294,2
Management fees	700,0	840,0	899,0	935,0	392,0	378,0	385,0
Assurance	668,2	393,7	273,7	231,1	243,8	354,0	384,3
Impots	1 367,0	397,0	572,6	943,5	1 838,9	376,2	280,0
Assurances et impôts	2 035,2	790,7	846,2	1 174,6	2 082,8	730,2	664,3
TOTAL	10 771,1	8 784,9	8 988,6	9 963,4	10 766,3	8 026,0	8 343,4
Amortissement			1 433,5	1 477,3	1 531,3	1 241,0	1 300,0
Frais fixe production	9 934,9	7 827,3	9 416,0	10 403,1	11 685,9	8 689,7	9 108,4

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